DELAWARE WATER GAP NATIONAL RECREATION AREA

Along the Delaware River in New Jersey and Pennsylvania

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DEFINING THE CULTURAL LANDSCAPE: RECOGNIZING CULTURAL AND NATURAL RESOURCE VALUES

Delaware Water Gap National Recreation Area encompasses nearly 70,000 acres, including four designated national historic districts and one national historic landmark. Many other areas within the park are potentially eligible for the National Register of Historic Places. The park straddles the Delaware River between Port Jervis, New York, and Delaware Water Gap, Pennsylvania, and includes several townships in New Jersey.

The geology and geography of the Delaware River valley affected settlement patterns and influenced building materials and architectural styles, all of which are reflected in the area's cultural landscape. Much of the historic fabric of the area was destroyed in preparation for the Tocks Island Dam and Reservoir, but barns, corn cribs, and farm houses, along with a patchwork of open spaces, cultivated fields, forests, and stone fences, all offer existing evidence of the valley's agricultural past. As a result of the valley's long settlement in historic and prehistoric times, there are also numerous archaeological sites scattered throughout.

The water gap is a distinctive geologic feature carved by the course of the Delaware River across the Kittatinny Ridge of the Appalachian Mountain chain. Natural areas within the park include native terrestrial forests, wetland and riparian areas, hemlock ravines and rhododendron glades, waterfalls, upland native grasslands, and river valley bottomlands. Suitable habitat exists for a variety of state-listed plant and animal species, and for three federally listed animal species. The Kittatinny Ridge is part of one of the major flyways for hawk migration. Peregrine falcons, golden eagles, merlins, and ospreys are some of the rarer hawks that have been sighted passing through the park during migration. Bald eagles use the park as winter habitat and have recently made several unsuccessful nesting attempts.

BACKGROUND

The first human habitation on the land of the Delaware Water Gap National Recreation Area began more than 10,000 years ago. Later, some 300 to 400 years ago, the Minisink

region along the Delaware River was the focal point of Native American agricultural settlements. Beginning in the eighteenth century, the valley became host to European Americans whose settlements and agriculture created a distinctive pattern on the landscape: a mosaic of open fields and forests, with farmsteads and a pattern of roads. In the late nineteenth and early twentieth centuries, the valley's dramatic scenic beauty and recreational opportunities made it a popular resort destination. By the mid-twentieth century, agriculture began to decline and tourists found other resorts to frequent.

In the 1960s, the Army Corps of Engineers planned to dam the Delaware River to create the Tocks Island Reservoir, and took much of the property in the area by eminent domain. In 1965, Congress created the Delaware Water Gap National Recreation Area to take advantage of the recreational opportunities that would be created by the proposed reservoir. In 1978, after the Tocks Island Dam was deauthorized as a result of environmental and economic feasibility concerns, all the land that had been acquired by the Army Corps was transferred to the National Park Service. That same year, the stretch of the Delaware River running through the national recreation area was designated a scenic and recreational river under the Wild and Scenic Rivers Act.

THE ISSUE

Delaware Water Gap National Recreation Area will be one of the first sites to initiate a cultural landscape inventory on a large, parkwide scale. This broad outlook will offer a better perspective on the landscape and will help cultural and natural resource managers recognize where there are overlapping interests and concerns.

The loss of open space is an important issue for cultural resource managers at the park, because open fields are a character-defining feature of the cultural landscape. The park began an agricultural leasing program in the early 1980s to help maintain this open space, but resource managers must work closely with farmers to ensure that the program does not negatively affect the natural environment and to protect subsurface archaeological artifacts.

METHODS

1. Parkwide Cultural Landscape Inventory Process

Park staff are currently working with the cultural resources specialist for the National Park Service Northeast Region to develop a cultural landscapes inventory. Delaware Water Gap National Recreation Area will be a test case within the park service for doing this work on a parkwide, landscape scale. Inventories will also be completed at a much smaller scale for the individual (formerly private) properties that now make up the park. This work is being made easier because a historic resources study was completed for the

park in 1996; it identified six themes (including transportation, agriculture, and settlement patterns), as well as the properties associated with those themes. Staff are now identifying the specific landscape features (such as orchards, field patterns, and transportation corridors) that contribute to any one of the themes in a specific portion of the park.

As part of the process for developing the landscape-level inventory, a set of 1939 aerial photographs for the park is being geo-rectified (see explanation in Tools and Approaches below). Using GIS, these maps are overlaid on a set of 1992 digital ortho quarter quadrants (DOQQs) for the park and a spatial analysis completed to see how certain cultural landscape characteristics have changed over time. For example, if resource managers examine open fields, they will be able to see areas where there has been forest encroachment. Because open fields have been determined to be an important cultural landscape characteristic, resource managers might choose to target some of these areas for tree removal. Other characteristics that could be examined would be farm clusters, field patterns, and transportation routes.

Once this inventory is complete, the cultural resource staff will work together with the natural resource staff to see where there is overlap in their interests. For example, special efforts might be made to clear wooded areas to maintain the traditional agricultural pattern when those areas have also been identified as valuable grassland habitat.

2. Agricultural Leasing Program

The encroachment of forest on open fields is a very real threat to the cultural landscape. Park managers realize that, in order to preserve the historic landscape, they need to maintain two characteristics: the open, patchwork character of cultivated fields, pastures, hedgerows, and stone field fences, and the historic agricultural land use. To do this, the park instituted an agricultural leasing program in the early 1980s, leasing federally owned lands back to local farmers. Currently nearly 3,000 acres of agricultural lands, both meadows and cultivated fields, are leased to farmers under 26 special use permits. The criteria set by park managers initially stated that only lands that had historically been farmed would be part of the program, and that character-defining features of the fields would be identified and preserved. This meant that the open field character and historic field sizes would be maintained, along with stone field fences and vegetated field boundaries. As a term of the lease, a farmer agrees to maintain field edges, including stone fences and hedgerows, and to control or remove invasive exotic vegetation. Farmers also consent to use the lowest-impact farming methods possible. In order to keep farmland open, farmers must also agree that for every acre put into crops they will brushhog an equivalent acreage of field every three to five years, which amounts to 1,500 acres kept open.

Farmers wishing to lease land within the park are faced with two challenges: the historic field sizes are smaller than what modern farm machinery would dictate to be profitable,

and the demolition of most farm buildings in preparation for the dam and reservoir has left nowhere to store farm equipment. In order to make the leases profitable, park managers have made concessions to farmers. Instead of the standard practice of leasing to the highest bidder, park managers lease land to good farmers who pay a lower lease rate but are willing to embrace park management goals.

Because the environmental effects of agriculture can be in direct conflict with the preservation of cultural and natural resources, park resource managers work directly with farmers to determine best agricultural practices. Initially this meant that farmers were encouraged to use the no-till method of cultivation in order to reduce soil erosion. Then, as the use of herbicides became more of a concern, farmers moved toward reduced-tilling and tilling (i.e., plowing). A long-term goal of the park is to make the transition to organic techniques.

Further modifications to the agricultural leasing program were made as park managers learned more about archaeological resources. In 1993, the Minisink Archaeological Site National Historic Landmark district was designated along the Delaware River, and park staff were concerned that some of the farming practices used on leased agricultural fields there could damage subsurface artifacts. Park managers again worked with farmers, experimenting with various tilling methods. Disk tilling was found to be harmful, so, working with integrated pest management specialists, the park developed a no-till regime with reduced herbicide use that would protect artifacts and be safe for the environment. In fields where artifacts are very close to the surface, crops are replaced with warm-season native grasses that do not require cultivation. The established native grass fields are mowed just once a year and do not require soil amendments or pesticides.

GIS Database

GIS (geographic information system) mapping was used to examine how large-scale, character-defining features of the landscape changed over time. The park began by geo-rectifying aerial photographs taken in 1939—scanning the photographs and identifying known points such as road intersections. Using special software, the known points were lined up and the map image stretched to line up with present-day aerial photos. Then they were overlaid with 1992 digital ortho quarter quadrants (DOQQs). (Each quadrant is numbered and photographed at a scale of 1:50,000, or one inch to 416 feet.). The old photographs were overlaid with the 1992 images to identify changes in features such as field patterns, forests, and structures. Park staff also have the ability to overlay both the geo-referenced 1939 aerials and rectified 1992 DOQQs within the same view and in the same coordinate system. With the transparency values adjusted on either one of the layers, both features can be seen simultaneously. This allows for a quick comparison of changes occurring from one layer to the next. An alternative method is also possible, in which polygons are digitized from one layer and then overlaid on the other.

Compliance Committee

The park has developed a compliance committee, an interdisciplinary team that meets monthly to assess the requirements for park activities to comply with state and federal laws. The committee includes a representative from the superintendent's office, three division chiefs, and professional staff at various levels from all the major disciplines. The committee chair makes sure that all the important issues are addressed in meetings, including both natural and cultural resource issues. According to one staff member, compliance committee meetings can be difficult at times, but the rule is that everyone's concerns are to be aired.

The compliance committee has yielded several valuable benefits that further the park's goals for resource management and environmental leadership:

- The existence of the committee has raised awareness among park staff that planning and compliance reviews should be considered for a variety of park activities, not just major development projects.

- Having a recognized committee that meets regularly has provided a structure for development of a standardized process for compliance reviews, available to any staff member responsible for coordinating or managing a park activity. This eliminates the need for park staff to determine on their own who needs to be contacted and then make those contacts individually. Now, staff can take advantage of "one-stop shopping" by contacting the committee chair and asking to be on the agenda for the next compliance meeting.

- Regular meetings of an interdisciplinary and interdivisional group of coworkers create a real sense of teamwork that is invaluable when discussing problems and trying to find solutions to some very challenging compliance issues.

- Regular compliance meetings make more efficient use of staff time. During each meeting, the committee reviews and discusses up to eight different projects. Formerly, each project would have required an individual meeting, meaning that the same staff members would have had to attend up to eight different sessions to accomplish what is now done in a single meeting. Of course, not all discussions result in a resolution. In some cases, a project discussion at the compliance meeting identifies complex issues that require a separate meeting; also, major development projects typically require a dedicated meeting. However, the majority of topics are efficiently addressed, with issues identified, a course of action agreed upon, and tasks assigned. If necessary, a follow-up discussion on the status or results of the assigned tasks is put on the agenda for the next meeting.

Some of the motivation for the formation of the compliance committee came from conflict and frustration arising from "eleventh-hour" compliance requirements that came to light only after a project design was completed, funding was received, and the contract documents were ready to be sent out for bid. As a group, the committee is in firm agreement that upcoming projects and activities, proposals submitted for funding, and sometimes simply ideas be brought to the table in order to discuss National Environmental Policy Act and other compliance requirements and incorporate them into cost estimates and project design from the beginning. Although last-minute compliance problems will still occur, the group agrees that regular meetings are the best way to minimize these problems.